

REMARKS

I. Status of the Claims

Original claims 1-78 are present in US Patent No. 5,573,648 (the '648 Patent), as originally issued. New claims 79-88 are presented above.¹ Applicants respectfully request examination of claims 1-88.

II. Introduction to the '648 Patent

As discussed in the Reissue Application Declaration by the Assignee, at the time of filing patent application 381,718, which issued as U.S. Patent No. 5,573,648 on November 12, 1996, Applicants failed to claim inventive methods and apparatus disclosed in the specification of the '648 patent. Applicants have filed this reissue application to remedy this error, and Applicants have now directed claims in this Preliminary Amendment to the inventive methods and apparatus disclosed in the original specification filed on January 31, 1995, but not originally claimed.

The claims of the '648 Patent are directed to gas sensors that are operative to sense a gas in an ambient atmosphere. The gas sensors include sensing and counter electrodes each having both an electronic conducting material and an ionic conducting material and a protonic conductive electrolyte membrane between and in contact with the sensing and counter electrodes. Because the sensing and counter electrodes have both an electronic conducting material and an ionic conducting material, gas sensors based on the subject matter of the '648 Patent typically do not require a power source for sensing of the gas. Thus, the life of any battery used in a commercial sensor covered by the '648 Patent, *e.g.*, a sensor for use as a residential CO sensor, is extended because the battery is only needed to power an alarm.

¹ In the event that the reissue application and the existing reexamination proceeding are merged, new claims 79-88 should be renumbered to be new claims 81-90, respectively.

New claim 79 is similar to original patent claim 1 and also recites that the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.

New claim 80 is similar to original patent claim 1 and also recites that the sensing electrode reacts with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.

New claim 81 is similar to original patent claim 1 and also recites that the sensing electrode and the counter electrode are on opposite sides of the first protonic conductive electrolyte membrane, and that the sensing electrode reacts with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode.

New claim 82 is similar to original patent claim 1 and also recites that the sensing electrode and the counter electrode are on opposite sides of the first protonic conductive electrolyte membrane.

New claim 83 depends from new claim 82 and further recites that the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.

New claim 84 depends from new claim 82 and further recites that the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.

New claim 85 depends from new claim 83 and further recites that the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.

New claim 86 is similar to original patent claim 1 and defines a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere. The non-biased electrochemical gas sensor comprises an electrical measurement means that detects changes in an electrical characteristic in the absence of any biasing voltage.

New claim 87 depends from new claim 86 and further recites that the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.

New claim 88 depends from new claim 86 and further recites that the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.

III. Support for New Claims 79-88

Support for new claims 79-88 may be found throughout the specification, claims, figures and abstract as originally filed. Support for new claim 79 may be found, for example, at Figure 1, at claim 1 and Col. 5, lines 30-42.

Support for new claim 80 may be found, for example, at claim 1 and Col. 3, lines 35-37.

Support for new claim 81 may be found, for example, at Figure 1, claim 1 and Col. 3, lines 35-37.

Support for new claim 82 may be found, for example, at Figure 1, at claim 1; and Column 7, line 67 to Column 8, line 1.

Support for new claim 83 may be found, for example, at Figure 1, at claim 1 and Col. 5, lines 30-42.

Support for new claim 84 may be found, for example, at Figure 1, at claim 1 and Col. 3, lines 35-37.

Support for new claim 85 may be found, for example, at Figure 1, at claim 1, at Col. 3, lines 35-37, and at Col. 5, lines 30-42.

Support for new claim 86 may be found, for example, at Figure 1, at claim 1, and at Col. 3, lines 35-37.

Support for new claim 87 may be found, for example, at Figure 1, at claim 1, and at Col. 5, lines 30-42.

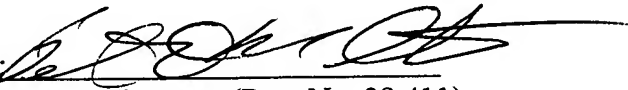
Support for new claim 88 may be found, for example, at Figure 1, at claim 1, and at Col. 3, lines 35-37.

IV. Conclusion

Each of new claims 79-88 is directed to subject matter that was originally disclosed but never claimed. Applicants request entry of new claims 79-88 and examination of claims 1-88.

Respectfully submitted,
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